A G E N D A

Manure Management Task Force

9:30 a.m. to 3:30 p.m.
October 20, 2005

Board Room
2811 Agriculture Drive, Madison
Department of Agriculture, Trade, and Consumer Protection

9:30 A. M.

1. Call to Order

2. Roll Call

9:40 A.M.

3. Born and Rude, Task Force Co-Chairs

   - Approve meeting notes

10:00 A.M.

4. *Presentations:* On-farm manure management research: Pioneer Farm and university research *(Tom Hunt and Larry Bundy)*; Buffer initiative *(Pete Nowak)*

11:45 A. M. to 12:30 P.M.

5. Lunch

12:30 P.M.

6. *Group Discussion*: Framework for evaluating options: data collection, planning, regulation, emergency response, other

3:00 P.M.

7. Co-chairs: Meeting Wrap Up

- Discuss additional meeting/listening sessions
- Review agenda for next meeting

8. Task Force Member Check Out

3:30 P.M.

9. Adjournment

DRAFT

Manure Task Force Meeting
September 26, 2005, Cranberry Country Lodge, Tomah

Task Force members in attendance:

Brian Rude, Co-Chair	Dairyland Power; DATCP Board
Monte Wick	Farmers Coop. Supply & Shipping
Andrew Hanson	Midwest Environmental Advocates
Jay Richardson	Prof. Dairy Producers of WI
Richard Gorder	WI Farm Bureau Federation Board
Rebecca Power	River Alliance of WI
Ken Blomberg	Rural Water Assoc.
Dan Fischer	Manitowoc Co. Exec.
Lisa Conley	WI Assoc. of Lakes
Wally Lueder	WI Farmers Union
Dana Cook	Manure Hauler, Sauk Co.
Kevin Erb	UW-Extension
Dan Brick	Dairy Business Assoc.

Task Force members absent

Steve Born, Co-Chair	Retired UW Professor
Kevin Connors	Dane Co. Dept. of Land & Water Resources
Robert Selk	Trout Unlimited

Also in attendance: ~10 agency staff

Next meeting:
Thurs. Oct 20, DATCP Boardroom, Madison.
If anyone feels strongly that we should choose a different location for November contact the Co-Chairs.

Tentative October Agenda:
- 1 hr: Present more information on the buffer initiative, timelines for phosphorus standard development, and economics on commodity supports.
- Short summary of the September meeting's discussion of the first half of the matrix.
- Discuss the second half of the matrix.

Action items:
- Agency staff work through the first half of the matrix and compile suggestions/recommendations.
- Agency staff find or create lists of a) research currently being done and b) current research needs. The group will review these lists and make some prioritizations.
- Prepare presentation/handouts for distribution before the October meeting on the following (for a 1-hr presentation):
  - local water quality standards and ordinances
  - timelines for making the evaluation of whether county manure storage ordinances are legally defensible (Stevenson)
  - the Buffer Initiative and how it relates to the P Index
  - the P Index, the TMDL process, and other models used to determine how much total P is entering a waterbody. This will also include an update on the DNR's efforts to develop a water quality criterion for phosphorus. (Stevenson)
  - biosecurity measures needed for manure transport (VandenBrook/DATCP staff).
  - the economic aspect of these issues, commodities, etc. (Farmers' Union, others?).
- Does DATCP have some analyses available on transportation costs/mechanisms?

Meeting Logistics
- Roll Call
- August 2005 meeting minutes approved
- Purpose of September meeting is to learn more about techniques for managing manure; then work through the matrix to pinpoint directions for future action.

Manure management programs and approaches –Castelnuovo; Stevenson, VandenBrook
See handouts:
- PowerPoint presentation "Manure management programs and approaches";
- Memo RE: "Manure Management Approaches and Options" providing a research summary on many options;
- Pdf file "Manure Management Approaches and Programs" sent via email is a compilation of news articles, sample forms, etc.

The presentation covered the following topics and provided examples of most:

- regional digesters
- tile line risks and practices
- manure relocation programs
- manure brokers
- manure incineration
- mandatory waste reports
- hauler licensing
- emergency response plans
- phosphorus index
- diary permits and waste management
- livestock manager certification programs
- manure spreading index generated by regional weather stations
- providing health insurance to farm families in exchange for good management practices
- insurance discounts for manure haulers with Environmental Management Systems
- proposed winter spreading ordinances (Dane, Brown and Manitowoc Cos.)
- extend well compensation program to cover manure contamination
- Pioneer Farms (will be discussed in more detail at October meeting)

The presentation also covered an explanation of DATCP & DNR complementary roles in the former "Notice of Discharge" (NOD) program for handling chronic manure management problems. Staff explained that the framework for jointly investigating manure management issues is in place and the agencies could implement a similar process to investigate and respond to the manure runoff incidents being considered by this task force. In the NOD program, DNR's role was in water quality protection, DATCP's role was providing agricultural expertise; they conducted joint investigations to provide a more balanced approach. Activity in the NOD program was greatly reduced when its specified funding source was removed and rolled into a larger competitive process. DNR has made many attempts to get separate funds for NOD program; to reinstate the funding mechanism statutory authority would have to be created for a separate funding pot for NR243 programs.

Discussion

- Brown County has proposed going beyond state rules with their winter spreading ordinance. DNR attorneys are evaluating whether that is legal or not. Issues include whether further protection is needed to protect water quality in that county, whether cost sharing is necessary, etc.
- Need to realize that moving manure can also spread diseases like Johnes; this could be a big problem. VandenBrook/DATCP staff could provide info on biosecurity measures that would be needed to transport manure.
- Manure brokering does take into account the nutrient content of manure.
- Discussed pros & cons of licensing vs. certification of haulers. (see the Information and Education category below)
- A Minnesota study on water quality benefits from increased grass & hay cover. Consider pasturing as an alternative for smaller farms. Introducing government price supports for grasses (like there are on grains) could help encourage that. Some of the Buffer Initiative work relates to this.
- A lack of water quality criterion for phosphorus may be hampering moving forward in phosphorus management—we have a target for phosphorus but it is statewide rather than localized. DNR will give an update on its efforts to develop a water quality criterion for phosphorus.

Discovery Farms presentation

"How Management Affects Nutrient and Sediment Losses" PowerPoint presentation –Fred Madison, Dennis Frame

Background:

- The presentation described the Discovery Farms partnership among the UW, USGS, Agricultural groups, Federal & state agencies. Their goal is to collect solid, quantifiable, unbiased data.
- Discovery Farms examine a variety of farms on different soils across Wisconsin; many are paired farms. They do surface water monitoring, tile line monitoring, and a host of other research. Discovery Farms will finish their first water year of monitoring this October.
- Questions to address: how much water really runs off of farm fields; when does this runoff occur, what is the magnitude of losses associated with this runoff; when do these losses occur? Need to know the quantity of runoff and the composition.

Take home points:

- Rainfall/Runoff: It doesn't run off every time it rains. The landscape plays a role in surface water runoff. Frozen ground runoff is significant in terms of the volume and loss of nutrients.
- Magnitude/Loss: Sediment loss occurs during non-frozen events. Sediment losses on these farms are much less than "T". With proper management farmers can achieve very low rates of soil loss. N & P loss is present during both frozen and non-frozen events. Most of the phosphorus loss is in the dissolved form.

- Manure Management: Manure spread on melting snow (or when melts are imminent) impacts water quality. Type of manure may or may not matter. Timing of application is important.

Conclusions:

- Discovery Farm sites are well below tolerable soil loss levels. Farms can achieve this and still be profitable. Phosphorus loss may be different on a farm with significant soil loss. 89-96% of rain at these sites stays on-farm.
- Farmers applying manure on frozen or snow covered ground need to evaluate the potential for a runoff event (critical time period) and runoff risk for a particular site (critical site).
- Manure applications in the late winter (when snow melt is imminent) should be done on fields which are internally drained and pose little/no risk of runoff reaching surface waters.
- Manure storage does not eliminate runoff potential; it may increase it. Farms with storage need to have it available during critical periods. Better to empty in early winter (Dec-Jan) than late winter?
- Need to define conditions (not dates) when manure spreading is risky: dates will always be wrong. Educate producers on risky conditions. Clearly identify sites that pose minimal risk.
- Questions for further consideration: Is it better to apply small amounts of manure over a number of days and fields? How does the level of bedding affect nutrient losses (pen pack)? What are the losses for manure applied in Dec-January?

<u>Discussion</u>

- Education is needed to apply the principles behind the rules so that operators know what is necessary for good management. Need to have the data to back up both the education & the rules.
- Discovery Farms is committed to writing guidance on best ways to manage manure. From producers' standpoint, getting info of this type is very effective.
- We need to set the water quality goal for the outcome we want. From the farmers' perspective, the goal is to keep the nutrients on the land. Regulations shouldn't be the main objective of this group.
- Discussed whether spreading in Dec/Jan on frozen ground could be beneficial or not—does the manure adhere better to the soil if it is later covered with snow? If you spread on north slopes which thaw slower than south slopes, does most of it go into the ground?

Framework for evaluating options: Group Discussion

See handout: "Evaluation of Means and Options" matrix

- Rude reminded the Task Force that their assignment is to make recommendations to the secretaries of the agencies. They can provide general guidance, and the departments will fill in the details.
- Task Force members discussed the first half of the matrix to determine which items could be the most helpful, which should be removed, combined or teased out, etc. Group suggested breaking some of the categories down so that options can be discussed individually rather than lumped.
- Member expressed the hope that the Task Force members are not only here to rubber-stamp agency priorities.

<u>Research & Development/Emerging Technologies and Management</u>

Research Agenda (i.e. what sorts of research need to be pursued?)

- Question on whether research being done now has input from both DNR & DATCP—DNR helps fund Discovery Farms, DATCP helps fund Pioneer Farm & UW research.
- How does the research being done by Discovery/Pioneer Farms come together into policy? (staff indicated that will be addressed somewhat next meeting)
- Secretaries should be encouraged to coordinate and develop consensus on future research and eliminate duplication. The two agencies do need to work together again, avoid political 'fence jumping'.
- Need to find or create lists of a) research currently being done and b) current research needs. The group will review these lists and make some prioritizations.
- One problem is that as producers & others work on advisory committees and seem to come to agreement but then the agencies end up changing things around again.
- When it comes to budget cutting, the two things that get a lot of cuts are research and education. Maybe this group can affirm how important these two items are to sustain.
- Need research on the best way to reach certain audiences, what types of incentives are effective for farmers.
- Staff will find or create lists of what research is currently being done, as well as a list of research needs for the group to look at and make some prioritization.

Research causes of incidents

- One focal point needs to be systematic data collection on each runoff event. Include what aspects leading up to the event contributed to it. Would have to be gathered by agency staff because they have the access to that information (haulers may not be able to release certain information due to legal mandates). Also need to create a compilation mechanism such as an annual summary of the data. One person noted that the DNR database currently has many gaps, and felt that it doesn't have detailed enough data to make broad recommendations yet.
- Researching funding mechanisms for nutrient management plans could be beneficial—some locations can tax directly for water protection issues. Urban water supply facilities may be interested in cost sharing for rural practices. Clarified that all farms are supposed to have nutrient management plans in place by 2008 if funding is available, but because funding is not currently available we should look for alternative sources.
- Group suggested merging the data collection category with the research category.
- To make it feasible for farmers to identify which low impact areas are available for spreading, there needs to be education for farmers on the soil types and weather conditions they can spread on.
- Sometimes it seems that agencies are more interested in litigation than in preventing problems.

Digester research

- Some members recommend changing this ranking from 2L to 3L. Digesters do very little to address runoff risks—the digester end-product has almost the same volume and nutrient content as the original manure had. Also, a limited number of operations could ever use it. Regional digesters can be good for use as an emergency storage, but can then create problems with intermingling pathogens.

Alternative management systems

There was general consensus from the group that agencies should support research & development of small, on-farm technologies that are feasible for individual farms (digesters, filter-presses), rather than large regional technologies. There may be regional solutions as well, but it would be useful to focus on small on-site technologies.

- *Spreading advisory*— Group agreed that this was a good idea and generally supported this tool. This would likely involve creating a management tool on the internet that uses future forecasts from the US Weather Service, snow melt probabilities, soil conditions, etc., to produce a risk factor for manure spreading at any given time. These sort of tools are not 100% accurate; need to use the farmers' common sense to make it work.
- *Grazing systems*— Group agreed to move this to I & E. There has already been a lot of research done on grazing systems. It may not be appropriate in this context.
- *Regional filter presses*—These have the same problems as digesters: they provide little water quality benefit or volume reduction, and increase pathogen concerns. Erb recommends removing this tool from the matrix. However Gorder noted that if research continues on filter presses they may be able to get small enough for individual farms. Could you use a centripital pump to separate solids from liquids to help be more efficient in spreading? Or are there other sorts of small systems that could be on-farm to reduce the volume of material?
- *Manure brokers*— Group agreed to remove this from the Research category and add to I & E, to provide information on how to exchange manure between farms. This concept can work well with high-value hog/poultry manure but would likely not be economically feasible for dairy manure because of high transportation costs. Kevin Erb has sample contracts that could be used as models, though there's a lot of variability and no set standard. One issue that would come into play is the requirement for CAFOs to only distribute manure to operations with 590 plan NMPs. Fertilizer law was amended to support distribution of manure off the farm, but it must go to fields with NMPs.

Alternative storage systems

Using storage bladders in place of temporary manure storage tanks in the field may have potential. Other systems weren't specifically discussed.

Alternative disposal systems— (didn't specifically discuss sanitary treatment)

- *Composting*—can be a very small or very large operation. We know how to do composting but don't have long term information on groundwater or air impacts—these would be the directions for research if composting is left in the research category.
- *Incineration*—need more research on this to determine whether it's practical or not. Could be controversial even if it works. This may be applicable to certain types of farms but most farms with a land base will want to keep the manure on the farm. Incineration results in losses of nitrogen that can be cost losses.

- *Transportation issues*—need more research into transportation costs and mechanisms. This comes into play in standard manure management planning, regional treatment/storage systems, manure brokering, etc. DATCP may have some cost analysis available.
- Under the Regulations category, consider allowing for fast tracking technologies we'd like to support which normally have to get a permit to do these things.

Evaluate BMP effectiveness—more research could be useful on pathogen aspects, impacts of phosphorus on surface water, and the ability of BMPs to control runoff. The group considered support for the Buffer Initiative, and asked to hear more about the initiative.

- *Reducing water usage*—need to find ways to reduce water usage in the dairy operations in order to reduce transportation costs. Parlor washwater and system cleaning create the bulk of the added water; need to devise ways to handle the washwater differently from the manure. However, manure storage facility pumps are currently designed to function with liquids, so efforts to reduce liquid manure would require a whole system renovation to handle manure as a solid or semi-solid. . Short term options for water reduction might include things like switching to water-saving sinks; long term options would require looking at entire system overhauls. This needs both research and education.
- *Tile lines*—Group supports research on tile lines in different soil types with different soil conditions.

Incentives

Monetary incentives—

- *Increase funding for preparing nutrient management plans (NMPs)* from state or federal levels so that all farms would have to have one as mandated in performance standards. A financial incentive would only make sense for operations that are not already required to have a nutrient management plan. DATCP has targeted grant funds to cost-share nutrient management plans where there have been manure incidents and the farms are not required to have plans. There was discussion on whether NMPs are the most cost-effective way to prevent manure runoff. NMPs help prevent chronic runoff impacts, though for acute impacts the benefits are less clear. However, both chronic and acute impacts should be addressed in the plans. Current NMPs are not water-quality based and may not be sufficient for water quality protection. NMPs do provide a fundamental education process to increase the farmer's understanding of all the components of planning. Group also discussed offering safe harbor in exchange for having and following an NMP (see below for more).
- *Manure insurance discounts*—these are already available; this item should be moved from Incentives to Education to disseminate pertinent information.

Non-monetary incentives—

There is a research need for a query of farm operators to determine which things really would serve as true incentives for farmers to better manage manure.

- *Health care coverage*—The economics of this would be very expensive for the government to get into. Health care issues become very complicated. It is a hard stretch for people to see the connection between health insurance and water quality; the group generally felt that the incentives should be directly related to the issue at hand. Group also questioned whether this truly would be an incentive for farmers.
- *Safe harbor/Limited Liability*—The group discussed offering safe harbor in exchange for having and following an NMP or EMS as a potentially good way to prevent acute and chronic impacts. Discussion revolved around the tradeoffs that would be needed to ensure water quality protection in exchange for limited liability. Some agriculture and environmental representatives indicated a willingness to consider the concept provided that a) the nutrient management standards were high enough and were water quality based (including phosphorus-based plans and standards, which would need to be developed), and b) were meaningful standards supported by research. Could set up an adaptive framework so that if further BMPs are needed they could be incorporated into the NMPs. Development of the water quality phosphorus standard is an essential component.
- *Green Tier*—may be related to the safe harbor idea. Green Tier applies specifically to permitted facilities. Safe Harbor could apply to operations of smaller size. However, could possibly adjust the green tier concept to apply to smaller farms.
- *Cooperative Compliance Programs (CCPs)*—these were not specifically discussed.

Information and Education

Some members suggested that education and research to gather data might be the most beneficial route of action at this point, rather than focusing on regulation or enforcement.

Technology Transfer—

- There have been some studies done on the differences between nutrient management workshops that just supply information versus ones that result in nutrient management still being implemented 3-5 years later. The key to long-tem success is having someone there to assist operators throughout the first 2 years until they're comfortable with implementing the plan. Personnel are currently not in place to handle this; UWEX has been receiving a lot of budget/personnel cuts. Secretaries could direct resources to UWEX to ensure these programs are put in place. Could perhaps create a mentoring program for farmers who have already successfully implemented their plans be a resource for other farmers.
- Add grazing, manure brokers, and insurance discounts to the Education category.

Training for applicators, farmers, consultants— The group generally supports training for applicators.

- There was a clarification on licensing versus certification. Currently, Wisconsin has a voluntary certification program for manure haulers, which is recognized by the industry as a viable and valuable program. The certification program involves broader education and encourages thinking of new approaches. Alternatively, the state or counties could mandate licensing, but this may not be as effective a program (those mandated to receive the training may not apply it as well as those attending voluntarily). Erb would like to see a requirement that permitted operations must use a certified or trained hauler. Farmers can become certified themselves, so they don't have to hire outside. Wisconsin's training program has partnered with the insurance industry to provide lower rates for certified haulers; the program has seen an 80% drop in incidences for people who have gone through 3 years of their program. Currently 40% of applicators are at level 1 in the voluntary certification program, with 20-25% at level 3.
- Another key for training is to provide flexibility that encourages new training and new technology each year, rather than being prescriptive about what has to be covered each year.

Develop print and web materials on manure management—Some material exists.

- Need development of informational materials on new Discovery Farms findings. Group recommends to secretaries that distributing this information to applicators and others is key.
- Creation of a weather advisory system could also fall into this category.
- Don't exclusively use the internet because not everyone will be reached that way. UWEX is a good outlet because it does have credibility with farmers, though this varies county to county. Distributing material through agricultural publications is good. Mailings are fine, and since all dairy farmers are regulated through DATCP, materials could be sent through their mailing list. Milk inspectors could bring a leaflet to farms. Keep messages short & sweet, or do them in phases with updates. Conferences will only reach the upper 10%--need to reach the other 90%. The Farmers Union & Farm Bureau do some education.
- Get the media to these Task Force meetings to report on the Task Force's discussions and findings.

Educate non-farming public—

- *On-farm visits*—Encourage on-site farm visits for agency staff and environmental groups who don't have as much familiarity with farms. Show both sides of issues in an unbiased and fair manner and promote understanding of issues from various perspectives. Ask secretaries to have their staff who deal with agricultural issues do some site visits to better understand the issues. Could potentially be a statewide directive for certain types of employees.
- *Public recognition programs* –River Friendly Farmer program in MN is a good model—farmers apply by completing a checklist of BMPs they use and receive designation as a River Friendly Farmer (or other sort of "gold star" designation). Whether a regulatory or voluntary model, some type of recognition program similar to this would be appropriate for those making active progress on water quality. This might not have a direct impact on water quality but it could bring some good public relations value and helps tell a story to other farmers. Some members pointed out that this program would need to be voluntary because some farmers might not want to receive the attention that such a designation might bring.
- *Urban sector education*—encourage "urban sacrifice" as well, such as phosphorus reduction in lawn care products. Discussed increasing the regulation of urban fertilizers to make it equal with agricultural regulations.

Responses to Action Items from September 26th MMTF meeting

Item requested	**Provided with mailing**	**Provided at October meeting**
Summary of work on the first half of the matrix	Included with minutes	
Research activities and needs		General summary of activity and needs, with recommendation for future coordination
Local regulatory power, standards, and issues related to winter spreading		Highlights with key issues
Buffer Initiative		Presentation by Pete Nowak
P Index		Presentation by Larry Bundy
DNR's modeling for phosphorous		Brief description of TMDLs
Manure handling issues (e.g. biosecurity, transportation)		Brief discussion
Impact of commodity payments	CRS summary and critique based on conservation concerns	
Spill response costs	Sugar river estimate	

State of Wisconsin

CORRESPONDENCE/MEMORANDUM

DATE: 9/19/2005

TO: Gordon Stevenson WT/2

FROM: Margie Devereaux SCR

SUBJECT: Request for Information Regarding Cost of Fish Kill on the West Branch of the Sugar River

In response to the request that was made by the Manure Management Task Force, we've attempted to articulate the cost of this incident. We have divided the cost into three components; the cost of our staff response, the cost of lost fishing opportunity, and the prior public investment that was impacted by this incident. We have the background information on each of these if you need to see more detail.

A. Cost of DNR Staff Response – $47,478

Each manure spill has a different level of staff response depending on the extent of the impact, the ability for us to intervene to lessen the impact, and the amount of time we need to spend determining the potential source of the contamination. For this incident the cost include staff costs, lab costs, Fish stocking for recovery, and the cost of short term containment.

B. Cost of Lost Fishing Opportunity – Estimated at $65, 026

This is figure calculated by using the formula Average Economic Fishing Trip Value X Average Number of Fishing Trips Per Day Per Mile X Number of Fishing Days Per Mile Lost all calculated for a number of years depending on an estimate of recovery for various stream stretches. With these variables, the final figure can vary significantly. We have recently begun to use this calculation for some of our enforcement cases. As another example, one recent calculation from an incident last fall resulted in an estimate of over $1.1 million..

C. Investment in Resource that was Compromised – $906,342 from 2000 to present

This particular project had seen improvements in water quality and has had intensive habitat improvement work installed recently. This was a stream that was undergoing significant recovery, and as a result of that, we were in the process of upgrading its classification and investing habitat funding. Associated with the habitat improvement work conducted by a partnership of the DNR, Dane County, the Upper Sugar River Watershed Association, Trout Unlimited and Deer Creek Sportsman Club as well as others, extensive public access agreements have been negotiated. So, this incident has set back this recovery effort and compromised the benefits that would have accrued from this heavy public/private investment.

A. West Branch of the Sugar River Fish Kill – March 2005

DNR Labor			
Labor	$ 7,970.		
Misc.	$ 451.		
Lab Sample Costs	$ 2,057.		
		$ 10,478	
DNR Fish Stocking			
Stocking for 10 years	$ 12,650		
Restocking for 10 years	$ 2,000		
Stocking assessment and tracking	$ 5,000		
		$ 19,650	
Other			
Berms, Diversions and Deep Tilling	$ 5,600		
Manure Hauling	$ 2,750		
Sand	$ 150		
Seeding	$ 150		
Reimburse Landowners	$ 700		
Polymer Costs	$ 8,000		
		$ 17,350	
Total			$ 47,478

Miscellaneous is mileage, meals and photos
Fish stocking costs are the minimum amount

Does not include landowner time
Does not include other volunteers time

Citations were $ 1,881 to the landowner and $ 3,324. to the hauler

B. Damage Assessment – Economic Loss – West Branch of Sugar River Fish Kill

Economic and ecological costs from fish kills and other aquatic resource damages have been well documented and assessed using several methods (Lipton and Strand; 1997; Anderson et al, 2002; Strange et al, 2004, USFWS and Stratus Consulting, 2000). In many cases, the negative economic impact from a fish kill has been based on the replacement value of the fish killed—while real costs to society and the aquatic ecosystem are not assessed or are perceived to be to difficult to quantify. The approach used in this damage assessment calculates the money anglers would no longer be spending because of the decreased number of fishing trips that are estimated not to occur on the West Branch of the Sugar River because of the fish kill. This estimated lost spending on fishing trips was used to assess the value of the resource damages associated with the West Branch of the Sugar River fish kill that occurred on February 24-March 1, 2005.

The fish kill on the West Branch of the Sugar River resulted in a dramatic decrease in the use of the fishery. Even though some sections of the stream did not experience a fish kill, they may still loose significant fishing pressure because of possible angler perception that since so much of the stream has been impacted, they may think it would not be worth fishing any of it. The economic loss to the local area/region arising from the fish kill and subsequent loss of fishing to the

West Branch of the Sugar River for the years 2005-2008 is estimated at $65,026.17. This estimate is based in large part on economic research conducted on the economic contribution of the combined West Fork of the Kickapoo and Timber Coulee trout fisheries; which was valued at over one million dollars (non-anglers only) for a single fishing season (Anderson et al., 2002).

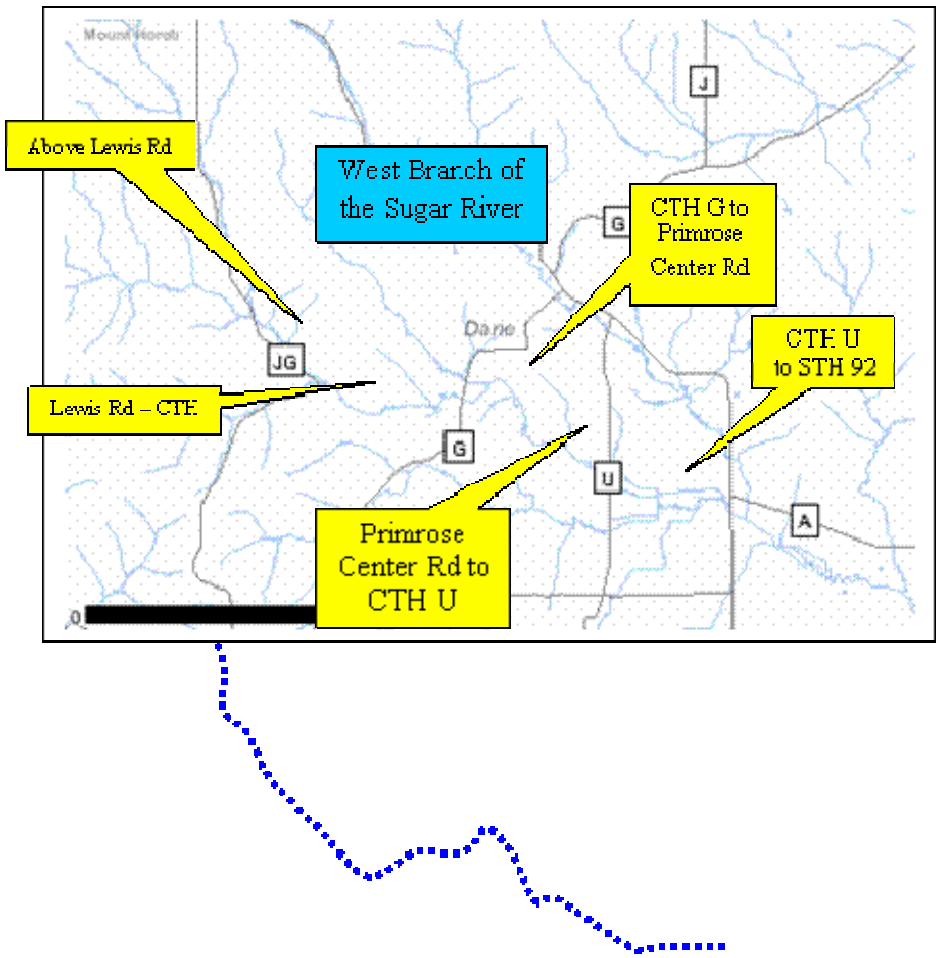
It should be noted that this damage assessment is an estimate and is based on best professional judgment and data obtained from creel surveys, studies and research conducted on other waters and situations. Every effort has been made to make this report as accurate as possible given the limitations of the available information.

The West Branch of the Sugar River has seen improvements in water quality had intensive habitat improvement work installed recently and had just been removed from the 303d impaired waters list. The stream was in the process of being upgraded in classification (Class II – Fisheries; Coldwater – Water Quality) when the fish kill occurred. Associated with the habitat improvement work conducted by a partnership of the Department, Dane County, Trout Unlimited and Deer Creek Sportsman Club, extensive public access agreements had been negotiated. Streams such as this with public access, habitat improvement work, and quality fisheries are typically heavily fished by anglers, particularly non-local anglers. In addition, "spring creeks" such as the West Branch of the Sugar have been covered in the national media and are many times a regional and national destination for trout anglers. These attributes are also common to other "blue ribbon" trout streams in the driftless area such as Mount Vernon and Black Earth Creek (Dane County) and Timber Coulee Creek (Vernon County). Similarities between Black Earth Creek, Timber Coulee Creek, and the West Branch of the Sugar River support use of the creel data collected on Black Earth Creek and Timber Coulee Creek to determine the amount of fishing pressure that was lost to the fish kill on the West Branch of the Sugar River for the next four years (2005-2008).

Fishing Pressure is a key metric used as a multiplier in determining the value of lost opportunity. For the West Branch of the Sugar River, the estimates of fishing pressure (and therefore lost economic spending) were made in comparison to similar, higher profile streams. The average amount of effort on the West Branch of the Sugar River was assumed to be 10% of the fishing effort seen on higher profile streams such as Black Earth Creek and Timber Coulee Creek (data from creel surveys conducted on these two streams were used in this report).

This estimate of the economic value lost from the West Branch of the Sugar River fish kill represents the combined effort of several DNR staff. It has been developed and reviewed by Fisheries and Water Resources Field, Headquarters and Regional staff.

Map of West Branch of the Sugar Rive and Areas Impacted by the Fish Kill



Rational for Determination of the Damage Claim

The damage claim is estimated by a calculation of the lost angler expenditures from the loss in fishing pressure that resulted from the fish kill. The formula used to calculate this loss is the following:

Average Economic Fishing Trip Value X Average Number of Fishing Trips Per Day Per Mile X Number of Fishing Days Per Mile Lost

The assumptions used to make this calculation are as follows:

1) Creel survey data from trout streams with characteristics similar to the West Brach of the Sugar River were used in determining the amount of use that this stream receives. Black Earth Creek (Creel Surveys, 1992,1993) and Timber Coulee (Creel Survey, 1992), are similar trout fisheries in terms of size structure and population and similar amounts of public access.
2) The calculation of the average amount of fishing pressure (hours/per mile) used the above creel data and expanded angler effort estimates to the entire reach of the stream classified as trout water (Black Earth Creek - 12 miles; Timber Coulee - 8.2 miles). This average hours of fishing pressure per mile derived from these creel surveys was judged to be representative of a high quality, trout fisheries in SW Wisconsin with special regulations and with high amounts of public access.
3) In order to convert the number of hours/mile of fishing effort into the number of trips, data on mean trip length in Elk Creek (2004), Black Earth Creek (1986), and Timber Coulee Creek (1992) were used. No trip length information was available from Black Earth Creek creels in 1992 or 1993.
4) The UWEX study of the economic value of angling in the Kickapoo Valley (Anderson et al, 2002) was used to obtain information on how much money local and non-local anglers spend on a fishing trip. Specifically, the economic value was defined as the amount of money local and non-local anglers spend in association with their fishing trip. The results of this study were used because of similarities in the trout fishery to the West Fork of the Kickapoo and Timber Coulee Creek, which were the streams studied in the research project referred to above. It is recognized

differences in the West Branch of the Sugar River and the Kickapoo Valley fisheries may exist because of the number of overnight accommodations, restaurants, and other amenities.

5) An adjustment for inflation (17%) according to the (US Bureau of Labor Statistics Web Site, 2005) was used to translate the economic value data at the time of the study (1999) into 2005 dollars. Estimates of the extent that stream reaches on West Branch of the Sugar River impacted by the fish kill and subsequently "lost" fishing pressure were made based on best professional judgment and the extent that the fishery would recover given natural reproduction and supplemental stocking.
6) Both local and non-local anglers were included in the estimate provided below because this assesses the total amount of money spent on fishing, The Kickapoo Valley Economic Study only counted the amount of money non-anglers spent on fishing, because that project was interested in the money "brought in " to the local area by angling (Anderson et al, 2002).

1. Determining the Average Value of a Fishing Trip

In the UWEX study of the Kickapoo Valley Area, conducted in 1999, angling was found to have a substantial impact on the local economy. The following values were obtained from their survey and applied to the "use values" for each of the reaches for each year. Nonlocal anglers were found to outnumber local anglers 3 to 1 and this was reflected in the estimate.

Local and Non-Local Spending on Fishing in the Kickapoo Valley Region 1999		
Angler Type	Percentage	Spending per Trip
Local	27%	$48.51
Non-local	73%	$167.61
Average Spending Per Trip (.27 x $48.51 + .73 X $167.61) = $135.45		

2. Calculating How Many Trips Were Lost From the Impacted Area Over the Next Four Years

The number of fishing trips lost was determined by the following:

a. Creel data was used to determine the average number of fishing trips are taken per mile of the average high quality trout stream in SW Wisconsin given similar public access, fish populations, and regulations. The following specific reaches of the fish kill were estimated to have the following reductions of fishing pressure due to the fish kill on given reaches of the stream based on best professional judgement:

		Percent Fishing Pressure Lost			
Reach of Stream	**Miles**	2005	2006	2007	2008
Above Lewis Road	0.2	10%	10%	5%	5%
Lewis Road-CTH G	4.1	95%	50%	25%	0%
CTH G to Primrose Center Rd.	2.0	80%	35%	10%	0%
Primrose Center Road to CTH U	1.5	50%	25%	10%	0%
CTH U to STH 92	2.4	50%	10%	0%	0%

The rational (based on best professional judgement) for developing the estimate of fishing pressure lost is explained below in the following table:

Reach of Stream	Miles	Percent Fishing Pressure Lost
Above Lewis Road	0.2	Above Lewis Rd: Headwater reach. Very narrow and small water with only a few holes and areas with potential to hold fish. Seasonal fishery due to heavy vegetation growth. Likely receives very limited early and late pressure due to low fish numbers. .
Lewis Rd – CTH G	4.1	Lewis Rd to CTH G: This is the area of major TRM habitat work that provides an attractive corridor to fish within. Dominated by many LUNKER structures, good pool –riffle ratio and some spring inflow that all hold and attract fish. Deep water is present which harbors large fish. This is the most well known reach of the WBSR by anglers. And will experience the greatest reduction in angler use. The loss of opportunity corresponds to the direct loss from the March '05 kill (and the publicity this stretch received) and the time necessary to rebuild a fishable population.
CTH G to Primrose Ctr Rd.	2.0	CTH G to Primrose Ctr Rd. : This area will experience a lesser amount of opportunity lost because of this stretch is somewhat less known and a bit more difficult to access by casual (non –local) fishermen. This area represents the true downstream limit of the '05 kill.
Primrose Ctr Rd to CTH U	1.5	Primrose Ctr Rd to CTH U : This area is currently the least heavily fished due to a large unimproved stretch of water downstream of Primrose Ctr Rd. that dissuades many fisherman.
CTH U to STH 92	2.4	CTH U to STH 92: First year angling reduction will be significant because of this is where most anglers access the WBSR, and the perception of loss from the '05 kill. This area will be return to "normal" use most quickly due to the proximity with the Mt. Vernon system (natural re-stocking) and annual stockings in this reach.

Notes: 5/31/05…..2000 wild brown spring (small) fingerlings (3") were stocked at each location: Hwy 92, CTH U, Primrose Ctr Rd, CTH G. All these fish were marked with a left pectoral clip for future recognition. September 2005 we will stock 500 yearling (9") rainbow trout at CTH U, Primrose Ctr Rd, and CTH G.

b. For each year impacted by the fish kill (2004-2007) the days available for trout fishing were determined.

Days in Season			
2005	2006	2007	2008
205	206	207	209

3 Multiply Days in Season for Each Year Times the Percentage of Lost Fishing for Each Corresponding Stream Reach and Year

The calculated number of lost fishing days for each of the years impacted by the fish kill, using the assumptions listed above are shown in the table below.

		Fishing Days Lost			
Reach of Stream	**Miles**	205	206	207	209
Above Lewis Road	0.2	20.50	20.60	10.35	10.50
Lewis Rd – CTH G	4.1	194.75	103.00	51.75	21.00
CTH G to Primrose Ctr Rd.	2.0	164.00	72.10	20.70	0.00
Primrose Ctr Rd to CTH U	1.5	102.50	51.50	20.70	0.00
CTH U to STH 92	2.4	102.50	20.60	0.00	0.00

3. Calculating the Average Number of Trips Per Mile for Driftless Area Trout Streams

The next major part of this calculation is an estimate of the average number of anglers' trips that are expected for a given mile of a high quality trout stream in the SW Wisconsin. To accomplish this, we relied on creel surveys that were conducted on Black Earth Creek and Timber Coulee Creek in the early 1990's. To determine the average number of trips for a given mile of stream, we followed the steps below:

a. Total hours of stream angler-use, per season (in the high effort reaches) was divided by the total miles of trout water in order to obtain a very conservative estimate of the total amount of use (hours) per mile. This result was then divided by the number of days included in the creel survey, which yields the **a**verage amount of time anglers spend on each mile of stream per day.

The creel surveys from Black Earth Creek (1992 and 1993) and Timber Coulee Creek (1992) were used to obtain values for the average amount of effort anglers expend while fishing which is expressed as average hours per day per stream mile. The results of this calculation are listed in the table below.

Hours of Effort/Days of Season/ Stream Miles = Average amount of time anglers spend on each mile of stream per day

Waterbody	Year	Hours of Effort	Days	Hours of Effort/Day	Stream Miles	Average Hours/Day /Mile
Black Earth Creek	1992	10379.52	152.00	68.29	12.00	5.69
Black Earth Creek	1993	6733.08	153.00	44.01	12.00	3.67
Timber Coulee	1992	3450.66	153.00	22.55	8.2	2.75
Average Hours/Mile/Day for the Creel Surveys Above						4.04

Adjustment (.10) for lower amount of use on the West Branch of the Sugar River .10 X 4.04 = .404

Note: the number of hours/miles/day for the creel surveys above was adjusted by multiplying this value by 10% because it was estimated that the West Branch of the Sugar River would receive only 10% of the angler use that the streams above receive.

b. Three creel surveys shown below were used to obtain the average trip length for anglers on high quality driftless area trout streams. The average of these surveys was found to be 2.56 hours per trip.

Trip Length (in Hours)		
Timber Coulee	1992 Creel	2.22
Elk Creek	2004 Creel	2.70
Black Earth	1986 Creel	2.77
Average trip Length in Hours		2.56

c. The trip length was then divided into the hours per mile to obtain the average number of trips per mile, as is shown below:

Average Hours Per Day Per Mile / Trip Length = Trips Per Day per Mile

.404 Hours Per Day Per Mile / 2.56 Hours Per Trip = **.158 Trips Per Day Per Mile**

Calculation of Total Lost Economic Value

To come up with the total lost economic value from the fish kill. The following formula was used:

Average Economic Fishing Trip Value multiplied by Average Number of Fishing Trips Per Day Per Mile multiplied by Number of Days Per Mile Lost to Fishing for the West Branch of the Sugar River

The table below shows the results of this calculation for each reach of the stream and for each year of impact.

Estimated Lost Economic Value Per Reach per Year					
Reach of Stream	Miles	205	206	207	209
Above Lewis Road	0.2	$102.44	$102.94	$51.72	$52.47
Lewis Rd – CTH G	4.1	$19,950.50	$10,551.48	$5,301.35	$2,151.27
CTH G to Primrose Ctr Rd.	2.0	$8,195.33	$3,602.95	$1,034.41	$0.00
Primrose Ctr Rd to CTH U	1.5	$3,841.56	$1,930.15	$775.81	$0.00
CTH U to STH 92	2.4	$6,146.49	$1,235.30	$0.00	$0.00
		$38,236.32	$17,422.81	$7,163.29	$2,203.74

Total Lost Economic Fishing Value	$65,026.17

The above values were totaled to apply to the entire area of the stream estimated to lose fishing use and for all 4 years of recovery.

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PARTNER CONTRIBUTIONS TO WEST BRANCH SUGAR RIVER TARGETED RESOURCE MANAGEMENT (TRM) PROJECTS

2000-2003

Partner / Year	DNR	USDA NRCS	DATCP	DANE COUNTY	UPPER SUGAR RIVER WATERSHED ASSOCIATION	TROUT UNLIMITED	DEER CREEK SPORTS AND CONSERVATION CLUB	DANE COUNTY CONSERVATION LEAGUE	MADISON FISHING EXPO	BADGER FLY FISHERS	UPPER SUGAR RIVER INITIATIVE	GRAND TOTAL
2000	$228,169	$30,000	$10,500	$15,800	$14,200	$1,500					$3,733	
2001	$170,000			$15,800	$19,419		$20,000	$4,668	$2,500	$2,500		
2002	$119,330	$24,757		$15,800	$20,000		$20,000	$8,000				
2003	$100,617			$15,800	$20,000		$20,000	$3,249				
TOTALS	$618,116	$54,757	$10,500	$63,200	$73,619	$1,500	$60,000	$15,917	$2,500	$2,500	$3,733	**$906,342**

Totals include cash funds and in-kind labor values

The water quality objective of the TRM projects was to reduce streambank erosion by 60%, resulting in an overall reduction in sediment load of over 13,000 tons/year. Through the TRM projects, over 20,000 feet of riprap (stone) was strategically placed to stabilize the streambank; 58,000 feet of streambank was shaped to help reduce erosion; 57 acres were seeded to help stabilize the streambank; 13,000 feet of fencing was installed to restrict livestock access; and over 1,000 fish habitat structures placed in the stream.

USDA NATURAL RESOURCE CONSERVATION SERVICE (NRCS) PL566 PROGRAM CONTRIBUTIONS TO WATERSHED AS A WHOLE

1981-1994

$1,640,150 ($1,130,280 from PL-566 funds, $509,870 other funds) Installation time period: 13 years
These funds are not reflected in the table above.

WISCONSIN DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION (DATCP) CONSERVATION RESERVE ENHANCEMENT PROGRAM (CREP) CONTRIBUTIONS TO WATERSHED AS A WHOLE

2000-2004

7 CREP 15-year agreements in the West Branch Sugar River Watershed.
CREP buffers cover 125.3 acres and buffer about 9 miles of streams at a state cost of about $25,000.
These funds are not reflected in the table above.

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Farm Commodity Programs: A Short Primer

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Summary

The U.S. Department of Agriculture (USDA) is required by law to subsidize approximately two dozen specified agricultural commodities. Several permanent statutes provide the basic authority for these subsidies; more recent multi-year farm bills shape their operation and funding levels. The most recent omnibus farm bill is the Farm Security and Rural Investment Act of 2002 (P.L.107-171). However, Congress since FY1989 has also passed 30 appropriations, authorization, or farm disaster acts adding approximately $53 billion in supplemental funding for USDA farm and related programs (through October 2004). This report will not be updated.

Overview

USDA commodity and price support programs represent the heart of U.S. farm policy, by virtue of their long history and cost. Net outlays for the Commodity Credit Corporation (CCC), USDA's program financing mechanism, have averaged nearly $15 billion annually from FY1995 to FY2004.[1]

Standing authority for USDA-CCC programs is provided mainly by three permanent laws: the Agricultural Adjustment Act of 1938 (P.L. 75-430), the Agricultural Act of 1949 (P.L. 81-439), and the CCC Charter Act of 1948 (P.L. 80-806). Congress frequently alters provisions of these laws through omnibus, multi-year farm bills, and through various budget measures. The most recent omnibus farm law is the Farm Security and Rural Investment Act of 2002 (P.L.107-171). This law is effective through 2007.

In addition to passing omnibus farm laws, Congress frequently provides supplemental funding for USDA farm and related programs. From FY1989 through early FY2005, Congress passed 30 appropriations, authorization, or farm disaster acts adding

[1] USDA's Farm Service Agency (FSA) delivers CCC-funded commodity program benefits through a network of local ("county") offices overseen by committees of elected farmers.

approximately $53 billion in such supplemental funding, over and above amounts authorized in the omnibus laws.[2]

The law requires USDA to offer income and/or price support for wheat, feed grains (corn, sorghum, barley, oats), cotton (upland and extra-long staple — ELS), rice, soybeans, other oilseeds (sunflower seed, canola, rapeseed, safflower, flaxseed, mustard seed), milk, peanuts, beet and cane sugar, wool, mohair, honey, dry peas, lentils, and small chickpeas.

Receipts for these commodities represent approximately 35%-40% of all farm cash receipts (estimated at $233 billion in 2004). Other commodities that normally receive no direct support include meats, hay, poultry, fruits, nuts, vegetables, and nursery/greenhouse products. But even producers of these items can be affected by farm policy decisions: they also might raise some price-supported commodities, and can benefit also from periodic laws providing them with their own supplemental disaster or economic relief.[3] Also, government intervention in one farm sector can influence production and prices in another sector.

Statutorily Required Support

Policymakers have devised a variety of program methods for the CCC to assist producers, each generally designed to achieve these broad objectives:

- To ***supplement farmer incomes***. Tools include annual *fixed decoupled payments* and *counter-cyclical deficiency payments for* grains, cotton, oilseeds, and peanuts; *counter-cyclical deficiency payments* for milk; and *nonrecourse marketing loans* and *loan deficiency payments* for grains, cotton, peanuts, oilseeds, wool, mohair, honey, dry peas, lentils and small chickpeas;

- To ***manage supplies and support commodity market prices***. *Marketing allotments* for sugar are available to restrict output. *Surplus purchases* help support farm prices for milk and various specialty crops.

The types and levels of support employed vary by commodity. Some are supported by only one method; others receive their support through a combination of program tools.

Wheat, Feed Grains, Upland Cotton, Rice, Peanuts, Soybeans, and Other Oilseeds. Eligible producers (those with past production histories for these crops) can receive *fixed, decoupled payments* each year (see rates in table); along with *counter-cyclical deficiency payments*, which make up the difference between the crop's average market price plus the fixed payment and its "target price" (see table), which is

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[2] These supplemental funds are included in the CCC spending cited on page 1. See also CRS Report RL31095, *Emergency Funding for Agriculture: A Brief History of Supplemental Appropriations, FY1989-FY2005*.

[3] For example, the 2002 farm law required USDA to pay apple growers $94 million to cover 2000 market year losses, and to spend $200 million annually to purchase fruits, vegetables, and specialty crops under the Section 32 program. See also "USDA Discretionary Support," page 4.

pegged to past production. Both payments to a producer are based on 85% of the farm's past production history, i.e., past acreage planted times per-acre yield, calculated under formulas in the 2002 farm law. Payment recipients can plant many combinations of crops on their land; they are not bound by the annual, USDA-imposed supply management rules for each crop in effect prior to 1996. Some restrictions do exist: for example, land generally cannot be replanted to fruits and vegetables, and conservation rules must be followed, on subsidized farms.

Crop	Loan Rates	Fixed Decoupled Payment Rates	Counter-Cyclical Target Prices
	2002/03, 2004/07 *	2002-2007	2002/03, 2004/07 *
Wheat, $/bu	2.80, 2.75	0.52	3.86, 3.92
Corn, $/bu	1.98, 1.95	0.28	2.60, 2.63
Sorghum, $/bu	1.98, 1.95	0.35	2.54, 2.57
Barley, $/bu	1.88, 1.85	0.24	2.21, 2.24
Oats, $/bu	1.35, 1.33	0.024	1.40, 1.44
Cotton, $/lb	0.52, 0.52	0.0667	0.724, 0.724
Rice, $/cwt	6.50, 6.50	2.35	10.50, 10.50
Soybeans, $/bu	5.00, 5.00	0.44	5.80, 5.80
Other oilseeds, $/lb	0.096, 0.093	0.008	0.098, 0.101
Peanuts, $/ton**	355	36	495

* *Reflects rates that change in some years.***Peanut quotas were ended by 2002 law; quota holders also are receiving $220/ton/year for 5 years as compensation.*

Producers, regardless of whether they receive the above payments, also are eligible for *nonrecourse marketing assistance loans* and *loan deficiency payments*. (See table for rates.) To qualify, a farmer pledges the stored crop as collateral. Nonrecourse loans generally must be repaid with interest within nine months or else the producer forfeits the pledged commodity to the government, which has "no recourse" other than to accept it in lieu of money. However, two features are intended to help avert forfeitures, and subsequent buildup of CCC-owned surpluses. First, the "marketing loan" feature enables the farmer to repay the loan at a USDA-calculated rate approximating market prices. If that repayment rate is below the original USDA loan rate, the farmer captures the difference as a subsidy (marketing loan gain). Loan deficiency payments (equal to marketing loan gains) also are available to eligible producers who choose *not* to take out a crop loan. (See CRS Report RS21779, *Grains, Cotton, Oilseeds, and Peanuts: Payments Under the 2002 Farm Bill*.)

ELS Cotton, Wool, Mohair, Honey, Dry Peas, Lentils, and Chickpeas. Producers of these commodities are not eligible for fixed decoupled or for counter-cyclical payments, but can receive *nonrecourse marketing assistance loans* and (except for ELS cotton) *loan deficiency payments*. Loan rates are specified in the 2002 farm law.

Sugar. A combination of *import quotas* and *nonrecourse loans* is intended to support prices at 18¢/lb.(raw cane) and 22.9¢/lb. (refined beet), at no net cost to the government. *Marketing allotments* limit production to avoid loan forfeitures and CCC costs; also authorized are payments (in the form of CCC-owned sugar) to farmers who agree to *acreage reduction*. (See CRS Issue Brief IB95117, *Sugar Policy Issues*.)

Milk. Price support is provided through surplus *commodity purchases*. The CCC buys bulk cheese, butter, and nonfat dry milk from dairy processors unable to sell them on the private market for at least the prices offered by the CCC. These prices are set so that processors will, in turn, pay farmers a milk price that reflects at least the federally mandated support rate of $9.90 per cwt. Additionally, through September 30, 2005, a "Milk Income Loss Program" offers *counter-cyclical payments* equal to 45% of the difference between $16.94 and the Boston Class I (fluid use) price, whenever that price is lower than $16.94; each farmer's payments are limited to 2.4 million lbs. of annual production (approximately a 120-140-cow herd). (See CRS Issue Brief IB97011, *Dairy Policy Issues*.)

Tobacco. Until recently, the tobacco program had operated under 65 years of supply control and price support. New tobacco quota buyout legislation that eliminates federal tobacco support at the end of the 2004 crop year was signed into law on October 22, 2004 (P.L. 108-357, Title VI, Fair and Equitable Tobacco Reform Act of 2004). Tobacco quota owners and active producers will be paid about $9.6 billion as compensation for lost rents and to aid in the transition to a free market system. Money to pay for the buyout will come from new assessments on tobacco product manufacturers and importers. The payment rate to quota owners is $7/lb. on 2002 basic quota, and the payment rate to active producers is $3/lb. on 2002 effective quota. Payments will be made in equal annual installments for 10 years. In the future, there will be no constraints on who can produce tobacco, where it can be grown, how much can be marketed, or how low the price can go. (See CRS Report RL31790, *Tobacco Quota Buyout Proposals in the 108th Congress.*)

USDA Discretionary Support

In addition to the explicitly-required subsidies described above, federal law has long given USDA the discretion to offer support for virtually any farm commodity. Examples have included *direct payments* of up to $10 per head for **hogs** in 1999, and of up to $8 per head for **lambs** (under a three-year lamb meat adjustment assistance program). Authority and funding for these various activities can come from a number of sources, including CCC (e.g. under the CCC charter act) and Section 32.

Section 32 (of P.L. 320, a 1935 law) permanently appropriates the equivalent of 30% of annual customs receipts to support the farm sector through a variety of activities. Most of this appropriation (now about $6 billion per year) is transferred directly to USDA's child nutrition account to fund school feeding and other programs. However, Section 32 also provides USDA with a source of discretionary funds (of which up to $500 million annually can be carried over each year), which it uses for "emergency removals" of surplus agricultural commodities, disaster relief, or other unanticipated needs. USDA annually purchases hundreds of millions of dollars in meats, poultry, fruits, and vegetables under Section 32 each year. (See CRS Report RS20235, *Farm and Food Support Under USDA's Section 32 Program*).

Payment and Loan Limitations

Most commodity subsidies are tied to units produced; therefore, higher output (sometimes past, sometimes current, depending upon the subsidy) means higher benefits, with some limits. For grains, cotton, and oilseeds, the law sets an annual ceiling for fixed decoupled payments at $40,000 per person, plus a separate annual ceiling for counter-cyclical payments at $65,000 per person. A separate payment limit of $75,000 per person applies to marketing loans gains for these crops and for dry peas, lentils and chickpeas.

Because an individual can receive *half*-payments on two additional farms, the effective annual cap on total combined payments actually has been $360,000 per person. Limits apply to individuals rather than farm units; thus, a single farm with multiple owners/operators might receive much more than the above amounts. Also, there is no per-person monetary limit on the volume of crops that can be put under CCC loan, or on how much can be forfeited in lieu of loan repayment. Finally, marketing loan gains in the form of USDA-issued commodity certificates (which farmers immediately redeem to satisfy loan repayments) are not counted toward the $75,000 loan cap. Peanuts have separate payment caps, as do wool, mohair, and honey. (See CRS Report RS21493, *Payment Limits for Farm Commodity Programs: Issues and Proposals.)*

Policy Discussion

When the commodity programs were first authorized in the early 1930s, most of the Nation's 6.8 million farms were diversified and small (by today's standards). There was a perceived need to address the severe economic problems then faced by this large segment of society, where about 25% of the U.S. population then resided. Moreover, it was argued, stabilizing the agricultural sector — through guaranteed minimum farm prices, income payments to producers, and/or various supply management techniques — would help to ensure an abundant supply of food and fiber at reasonable prices in the future.

Since then, farming has changed significantly. Most commercial agriculture is now confined to fewer, larger, and more specialized operations. In 1997 about 157,000 large farms, with annual agricultural sales averaging about $900,000, accounted for 8% of all U.S. farms but 72% of all farm sales. Most of the nation's 2 million or so farms are mainly part-time, where operators rely on off-farm sources for most of their income. Farm residents appear to account for less than 2% of the total U.S. population — Census no longer publishes farm population data.

Also, the economic health of farmers has become increasingly tied to the needs of processors and marketers, and to global markets. Critics have long argued that U.S. commodity-based policies are outdated and may even be detrimental to modern agriculture, and to society in general. Although the programs have retained many features dating to the 1930s, they also have evolved — in response both to the changes occurring in agriculture and the economy, and to budgetary and trade pressures. At issue is whether they have evolved quickly enough, or in the most appropriate ways.

Congress and the Administration sought, for many decades, to steer price and income support programs onto a more "market-oriented" course, so that producers would look to

the private market rather than the government for economic rewards from production agriculture. A succession of farm bills, particularly since the 1970s, moved farm policy in this direction, mainly through incremental changes in existing programs. The 1996 Federal Agriculture Improvement and Reform Act (P.L. 104-127), written at a time of high farm prices and expanding exports, was aimed at accelerating the programs' market orientation.

However, unanticipated declines in export markets and in farm prices both drove up the projected cost of programs authorized by the 1996 farm law (primarily marketing loans and loan deficiency payments), and also led Congress to enact supplemental aid each year. These record-high subsidies helped the farm economy as a whole remain in relatively strong financial condition. However, most policymakers and farm groups sought a new farm law that would preclude the need for such ad hoc assistance bills. This led to adoption, in the 2002 law, of new counter-cyclical assistance whereby subsidies (for grains, cotton, oilseeds, and milk) automatically increase when farm prices decline, and decrease when they rise (similar to the older target price/deficiency payment subsidies).

This and other commodity provisions in the law attracted widespread criticism from those here and abroad who viewed them as reversing the market-oriented course Congress had charted for long-term farm policy in 1996. These critics have argued that the 2002 bill perpetuated outmoded, commodity-oriented policies that tie support to the prices of a few major row crops; with legislated target prices and loan rates set well above market prices, U.S. producers continue to over-produce supported commodities, distorting market prices and global trade, they argue. (The Bush Administration, in its FY2006 budget proposal, reportedly is calling for reductions in the programs of $5.7 billion over 10 years.) Furthermore, the adoption of expanded farm subsidy programs has undermined U.S. credibility in world trade negotiations, where the United States has called on other countries to reduce their own trade distorting agricultural subsidies, they contend.[4]

Supporters counter that commodity programs provide needed support to farmers who otherwise would see plunging incomes and asset (e.g., land) values due to unfavorable and unpredictable price and market conditions worldwide. The bill maintains market orientation by continuing to give farmers the flexibility to plant crops based on market signals unbound by government supply management rules. The 2002 law has complied with congressional spending limits, and provided no more in subsidies than farmers received under the last omnibus farm law as supplemented by the emergency farm measures, they have noted. The new law contains a so-called "circuit breaker" that requires USDA to cut trade-distorting subsidies in order to remain within the $19.1 billion limit on such spending under the Uruguay Round Agreement on Agriculture. And, the 2002 law keeps the United States in a stronger position to negotiate new agricultural trade reforms: the United States should not unilaterally cut its own subsidies until foreign competitors reduce their own often higher subsidies, as well as their barriers to U.S. farm exports, supporters contend.

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[4] A World Trade Organization panel released findings in 2004 in a case brought by Brazil against U.S. cotton subsidies. The implications for the cotton program could affect payment mechanisms for other commodities (see CRS Report RL32571, *U.S.-Brazil WTO Cotton Subsidy Dispute*).

Soil and Water Quality: An Agenda for Agriculture

Committee on Long-Range Soil and Water Conservation Policy, National Research Council (1993)[1]

Excerpt from pp. 153-155

Incremental Redesigning of Agricultural Policy

Because of the history of multiple, competing objectives of agricultural policies and because of a recognition that agricultural policies are a major influence on commercial producers of commodity crops, there has been increasing attention focused on redesigning agricultural policies to remove any barriers to achieving environmental goals.

Recent research has pointed out that the current structures of price support and supply control programs erect barriers to the adoption of farming systems that improve soil and water quality. Where such barriers exist, they can seriously impede efforts to induce producers to change the way they manage their farming systems to protect soil and water quality.

Incentives are Perverse

Price support, deficiency payment, and supply control policies should be reformed to remove the barriers to voluntary adoption of improved farming systems.

The structure of U.S. farm programs induces a bias toward intensive farming practices to boost yields and to expand the base acreage of the cropland that can be enrolled in the price support programs. Deficiency payments are directly proportional to a farmer's historical yield, which is used to establish the program yield, and the historical cropland, which is used to establish the base acreage for the crop. These features create incentives for producers to increase plantings and boost yields to capture higher government payments in the future. The 1985 Food Security Act (PL 99-198) and the 1990 Food, Agriculture, Conservation and Trade Act (PL 101-624) have moderated this bias by freezing program yields at 1986 levels and by applying constraints on the expansion of base acres.

In a study of potential farm bill influences, however, Dobbs and colleagues (1992) found that current agricultural policies still pose barriers to the adoption of more sustainable farming systems for some farms, despite the modifications made in the 1990 Food, Agriculture, Conservation and Trade Act. For example, simulated reductions in target prices appeared to make

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[1] *Available on the web at http://www.nap.edu/books/0309049334/html/*

farms that practice sustainable agriculture more profitable than farms that use conventional agricultural practices in northeastern and southeastern South Dakota. Dobbs and colleagues (1992) reported that giving producers who participate in agricultural programs more flexibility with respect to the choice of crop rotations did not consistently favor producers who practice sustainable agriculture.

Runge and colleagues (1990) reviewed recent farm level studies that explored the difficulties that farmers confront when they attempt to participate in government programs and pursue environmentally sound practices simultaneously. They summarized their findings as follows:

These case studies suggest that farmers are currently confronted by a confusing set of signals that make it difficult to remain both profitable and environmentally responsible. In one case study in southwest Minnesota, farmers describe the current government programs as putting them in a "vise grip," resulting in cropping practices that distort the allocation of fertilizer and chemical inputs, and discourage crop rotations. While such practices, if changed, would not in themselves solve all of the environmental problems affecting agriculture, they would at least not aggravate them, as current policy appears to do. A second case study, conducted in Iowa, documents a similar set of problems, showing that under current federal farm legislation, crop rotations are discouraged in favor of continuous corn, using the highest levels of nitrogen fertilizer. A third case study, in southwestern Minnesota, an area similar to many other parts of the upper Midwest with vulnerable soils and groundwater, shows both commercial fertilizer and livestock waste must be closely accounted for if total nitrogen use is to reflect best-management practices. It also suggests that some land areas are simply more vulnerable to environmental damages than others, implying the need for more targeted environmental policies. Together, these case studies suggest that government policies and on-farm decisions are closely linked, and that better management practices will require both a different set of signals from Washington, and a renewed commitment to careful and precise farming methods that account for off-farm effects (Runge et al., 1990:v).

These studies reinforce some of the findings of a National Research Council study on alternative agriculture:

Federal policies, including commodity programs, trade policy, research and extension programs, food grading and cosmetic standards, pesticide regulation, water quality and supply policies, and tax policy, significantly influence farmers' choices of agricultural practices. As a whole, federal policies work against environmentally benign practices and the adoption of alternative agricultural systems, particularly those involving crop rotations,

certain soil conservation practices, reductions in pesticide use, and increased use of biological and cultural means of pest control (National Research Council, 1989a:6).

The lack of crop diversity either within a field or over time (in rotation) appears to be a major constraint in achieving high soil microbial activity necessary for high soil quality and attendant benefits for water quality (Harwood, 1993). The barriers created by current commodity policy may also constrain the development of innovative cropping systems to improve input use efficiency or resist erosion and runoff that were outlined in Chapter 2. Thus, the disincentives in agricultural programs for rotations and crop diversity are an important barrier for improving soil and water quality.

The incentives embedded in agricultural programs to increase production of certain crops are also a problem. The lion's share of government payments goes to producers of feed grains—especially corn, food grains (wheat and rice), and cotton—and indirectly to dairy products. Growers of most livestock products, fruit, vegetables, hay, and nearly all specialty crops are excluded from the direct influence of government programs. Although many vegetable and fruit crops that are not part of government programs receive high agrichemical applications, these crops occupy relatively small areas on a national level. In contrast, corn, cotton, soybeans, and wheat received an estimated 65 percent of total agrichemical applications (Fleming, 1987). Reichelderfer (1985) also concluded that program crops were more soil eroding on average than nonprogram crops.

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